

## **Talcopsaltriini, a New Tribe for a New Genus and Species of Australian Cicada (Hemiptera: Cicadoidea: Cicadidae)**

M.S. MOULDS

Entomology Department, Australian Museum, 6 College St, Sydney NSW 2010, Australia  
msmoulds@bigpond.net.au

**ABSTRACT.** A new tribe, Talcopsaltriini, subfamily Cicadinae, is described to accommodate *Talcopsaltria olivei*, n.gen., n.sp. a species recorded from Cape York Peninsula, Queensland. Relationships of the Talcopsaltriini are discussed and comparisons made with allied tribes. A modified key to Australian tribes of the subfamily Cicadinae is provided. The terms *anterior* and *posterior cranial depressions* are introduced for two structures on the head previously unnamed.

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A new Australian cicada from north-eastern Queensland has proved to be so different from other known species that it warrants not only a new genus but also a new tribe. *Talcopsaltria olivei* n.gen., n.sp. is described and placed in a new tribe Talcopsaltriini, subfamily Cicadinae. This new tribe is compared with allied tribes.

The following abbreviations are used: AM, Australian Museum, Sydney; AE, collection of A. Ewart, Caloundra; JO, collection of J. Olive, Cairns; MSM, collection of M.S. Moulds, Kuranda; PH, collection of P. Hutchinson, Perth; QM, Queensland Museum, Brisbane.

### **Terminology**

Terminology for morphological features follows that of Moulds (2005) for all structures except those of the tymbal that follow Bennet-Clark (1997).

Two structures are named here for the first time; the *anterior* and *posterior cranial depressions*. These are external pitted depressions for internal musculature attachment of the retractor muscles of the mandibular

and maxillary stylets. The anterior cranial depressions are located one each posterolaterally of each lateral ocellus and are either single, shallow, somewhat circular depressions or clustered, multiple, irregularly-shaped depressions. The posterior cranial depressions are a little more posterolateral and are normally just visible against the anterior margin of the pronotum as single, nearly circular shallow depressions that in some species are very distinct.

### **Subfamily Cicadinae Latreille, 1802**

#### **Tribe Talcopsaltriini new tribe**

In a recent paper (Moulds, 2005) I reviewed the tribes of Australian cicadas and provided keys to their identities. Using the key to the subfamily Cicadinae from that paper, the new tribe described here comes out as Platypleurini. It indeed has a number of attributes in common with the Platypleurini as follows: vertical compression of the body; pronotal collar moderately broad and even in width between the lateral angles; postclypeus broad in dorsal view giving the

head a blunt appearance (although not in *Koma* Distant, and to a lesser degree in *Sadaka* Distant); male abdomen stout, in length less than head and thorax together; male abdominal tergites 2 and 3 wider along their midlines than tergites 4–7; epimeral lobe reaching to operculum; primary spine of the fore femur prostrate; male genitalia with aedeagus tubular, simple.

There are, however, six notable differences that separate the new tribe from the Platyleurini: fore wing precostal area is not dilated; pronotal collar lateral margin is not dilated horizontally; male pygofer with a well developed distal shoulder; male uncus completely lacking of clasper development on either side of base of median lobe (Platyleurini show low swellings at the median lobe base); male timbal cover substantially reduced so that less than half the timbal cavity is covered (Platyleurini have the timbal covers reaching the metathorax); and reduction of the timbal cover is entirely lateral whereas in those platyleurine genera with reduced timbal covers (*Afzeliada* Boulard, *Brevisiana* Boulard, *Ioba* Distant, *Kongota* Distant, *Platyleura* Amyot & Serville, *Pycna* Amyot & Serville, *Sadaka* Distant, *Ugada* Distant and possibly a few others not examined) there is a vertical contraction of the timbal cover from the top of the timbal cavity and any lateral reduction is minimal. These differences suggest either a different origin for *Talcopsaltria* n.gen. from that of the Platyleurini, or a sister group relationship within the Platyleurini to all other platyleurine genera. The latter difference, that is timbal covers that reach to the top of the timbal cavity in *Talcopsaltria*, is considered particularly significant in showing that *Talcopsaltria* has a different origin [see discussion of timbal cover development in Moulds (2005: 413)] and I believe shows a distinction distant enough from the Platyleurini to warrant separate tribal status.

Within the Australian fauna there are similarities also with the Thophini and Cryptotympanini. While both have well developed timbal covers that close the timbal cavity, the Thophini have highly modified swollen timbal covers and associated abdominal modification while the Cryptotympanini have a significantly different thecal shape where the theca recurves basally through 180° or more. Australian Cicadinae tribes with minimal timbal cover development (covering less than half the timbal cavity) are the Jassopsaltriini, Burbungini and Tamasini. Unlike *Talcopsaltria* all three of these tribes have timbal covers that do not reach the top of the timbal cavity. Further, the Jassopsaltriini and Burbungini have the base of the theca shaped similarly to that of the Cryptotympanini and an epimeral lobe not reaching the operculum while the Tamasini

have differences that include a very different basal plate where the basal part of the basal plate is directed upwards and is nearly parallel with the thecal shaft.

There are no New Guinean or Indonesian cicadas with timbal covers that reach half way or less across the timbal cavity.

**Type genus:** *Talcopsaltria* n.gen. (type species *Talcopsaltria olivei* n.sp.)

**Included genera:** *Talcopsaltria* n.gen.

### Diagnosis

Head with distance between supra-antennal plate and eye much greater than length of antennal plate. Postclypeus rounded in transverse cross-section; postclypeal ridges lacking transverse grooves towards distal ends. Fore wing pterostigma present; costa parallel-sided to node; veins C and R+Sc close together; vein RA<sup>+</sup> aligned closely with subcosta (Sc) for its length. Hind wing with anal lobe broad and vein 3A curved at distal end, long, separated from wing margin. Meracanthus gradually tapering to a point, triangular or nearly so. Abdomen with epipleurites reflexed to ventral surface, epipleurites not kinked inwardly in a V-shape. Timbals extended below wing bases. Timbal covers flat, clearly not reaching metathorax, not reduced dorsally or ventrally so that the upper margin originates from the very top of timbal cavity and the lower margin extends from near auditory capsule. Male pygofer with upper lobe absent; distal shoulder well developed, lobe-like; pygofer basal lobe moderately developed. Uncus undivided and dominated by large median lobe that is digitate or basically tubular. Claspers entirely undeveloped, absent. Aedeagus with ventral rib completely fused with basal plate; theca with shaft gently curved more or less in an arc; pseudoparameres absent.

### Distinguishing characters

Separated from other tribes by a combination of the following two characters: distance between supra-antennal plate and eye much greater than length of supra-antennal plate; hind wing 1st cubital cell at distal end shorter than that of 2nd cubital cell. Males are easily distinguished by a combination of the following two characters: a short abdomen that is less than the length of head and thorax together; small timbal covers that cover half or less of the timbal cavity and protrude forwards from the very top of the timbal cavity.

### Key to Australian tribes of the subfamily Cicadinae

The new tribe Talcopsaltriini, keys out after couplet 3 of the key to Australian tribes of Moulds (2005: 429), as follows:

- 1 Head with vertex very wide so that the supra-antennal plate clearly reaches less than half way to eye ..... 2  
 — Head with vertex of average width or narrow so that the supra-antennal plate reaches at least half way to eye ..... 7
- 2 Epimeral lobe not reaching operculum ..... Burbungini  
 — Epimeral lobe reaching operculum ..... 3
- 3 Fore leg femoral primary spine lying flat, prostrate ..... 4  
 — Fore leg femoral primary spine erect ..... 5
- 4 Lateral margin of pronotal collar dilated horizontally; male timbal cover reaching, or almost reaching, metathorax ..... Platypleurini  
 — Lateral margin of pronotal collar not dilated horizontally; male timbal cover only reaching about half way to metathorax ..... Talcopsaltriini **n.tribe**
- 5 Male ..... 6  
 — Female ..... Cryptotympanini or Thophini
- 6 Timbal covers flat ..... Cryptotympanini  
 — Timbal covers inflated, sac-like ..... Thophini
- 7 Pronotal collar with a single mid-lateral tooth; male opercula (of Australian species) very long, covering some  $\frac{2}{3}$  length of abdomen ..... Dundubiini (subtribe Cosmopsaltriina)  
 — Pronotal collar with lateral margin smooth; male opercula very long, covering some  $\frac{2}{3}$  length of abdomen ..... 8
- 8 Head considerably less than width of pronotum; fore wing veins C and R+Sc widely separated ..... Cyclochilini  
 — Head about as wide as pronotum; fore wing veins C and R+Sc abutted for their length ..... 9
- 9 Lateral ocelli widely separated, the distance between them about equal to the distance between each lateral ocellus and eye ..... Jassopsaltriini  
 — Lateral ocelli closely spaced, the distance between them considerably less than the distance between each lateral ocellus and eye ..... Tamasini

#### Genus *Talcopsaltria* n.gen.

Figs 1–10

**Type species:** *Talcopsaltria olivei* n.sp.

**Included species:** *Talcopsaltria olivei* n.sp.

**Etymology:** Derived from the word *talc* and referring to the white fine “dusting” over the body, and the Greek *psaltria*, a female harpist and a traditional ending for many cicada generic names; feminine.

#### Diagnosis (Figs 1–10)

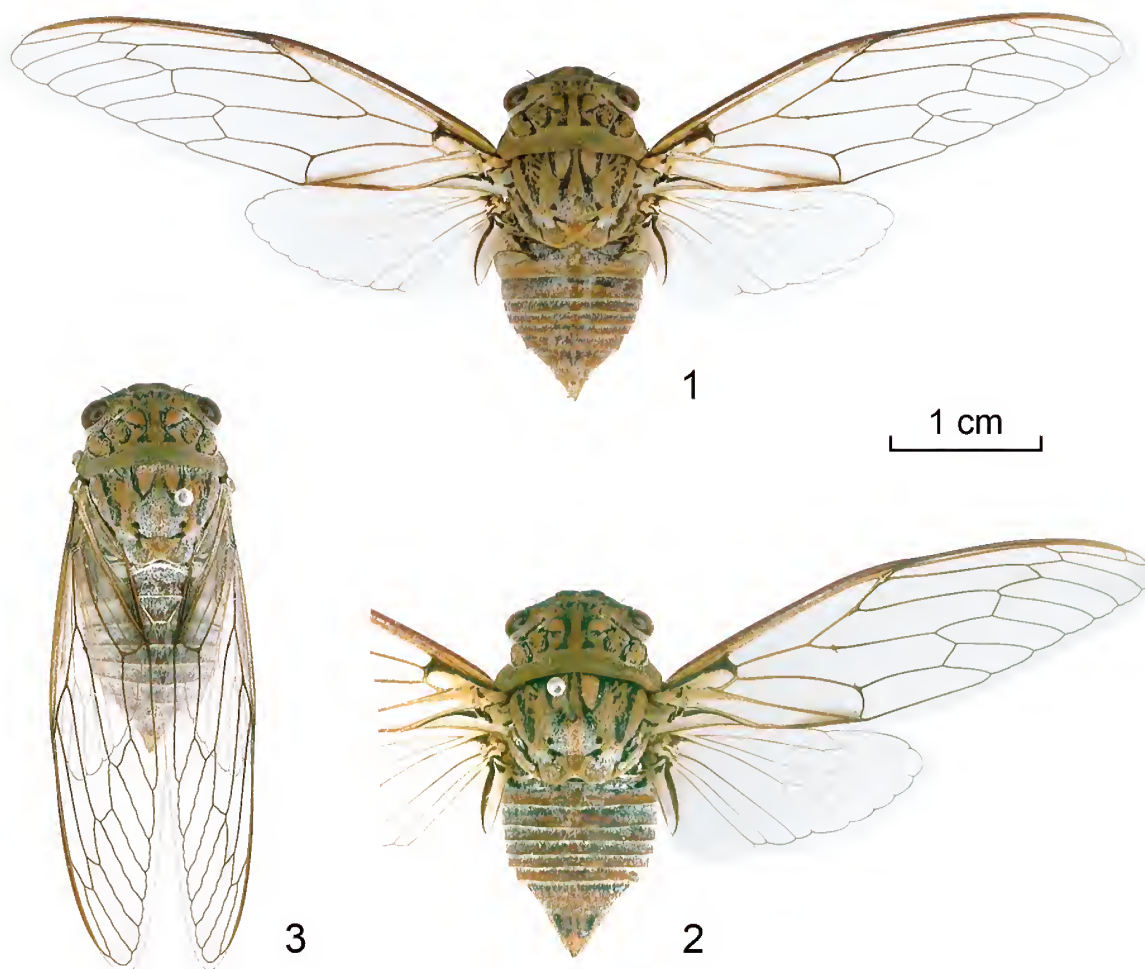
Body tending compressed vertically; extensively covered with a talc-like “dusting” of fine white pubescence mixed with a fine white, waxy exudation.

*Head* including eyes wider than mesonotum but clearly narrower than lateral angles of pronotal collar; postclypeus in lateral profile rounded between “top” and “sides”, midline clearly depressed.

*Thorax.* Pronotal collar width at dorsal midline moderately broad, but less than diameter of eyes; lateral margins weakly ampliate, no mid lateral tooth but edged with many microscopic spine-like bristles. Cruciform elevation wider than long. Epimeral lobe reaching operculum. Metanotum entirely concealed at dorsal midline.

*Wings* (Figs 1–3, 7). Fore wings hyaline; infuscation overlaying distal end of vein CuP+1A and adjacent portion of 2A+3A; 8 apical cells; subapical cells absent; ulnar cell 3 angled to radial cell; vein CuA only weakly bowed so that cubital cell no larger than medial cell; veins M and CuA widely separated at basal cell making basal cell broad





**Figs 1–3.** *Talcopsaltria olivei* n.sp.: (1) holotype male, dorsal view; (2) paratype female, dorsal view; (3) paratype male, dorsal view with wings folded in resting position.

and tending to be rounded; vein  $CuA_1$  divided by crossvein  $m-cu$  so that proximal portion longest; wing outer margin developed for its total length, never reduced to be contiguous with ambient vein. Hind wings with 6 apical cells; no infuscation on ambient vein; width of 1st cubital cell at distal end shorter than that of 2nd cubital cell; anal lobe broad with vein 3A curved, long, separated from wing margin.

*Legs.* Fore leg femoral primary spine lying flat, prostrate. Meracanthus with spur slender, triangular.

*Opercula* (Fig. 10). Male opercula completely encapsulating meracanthus, covering tympanal cavity but not meeting.

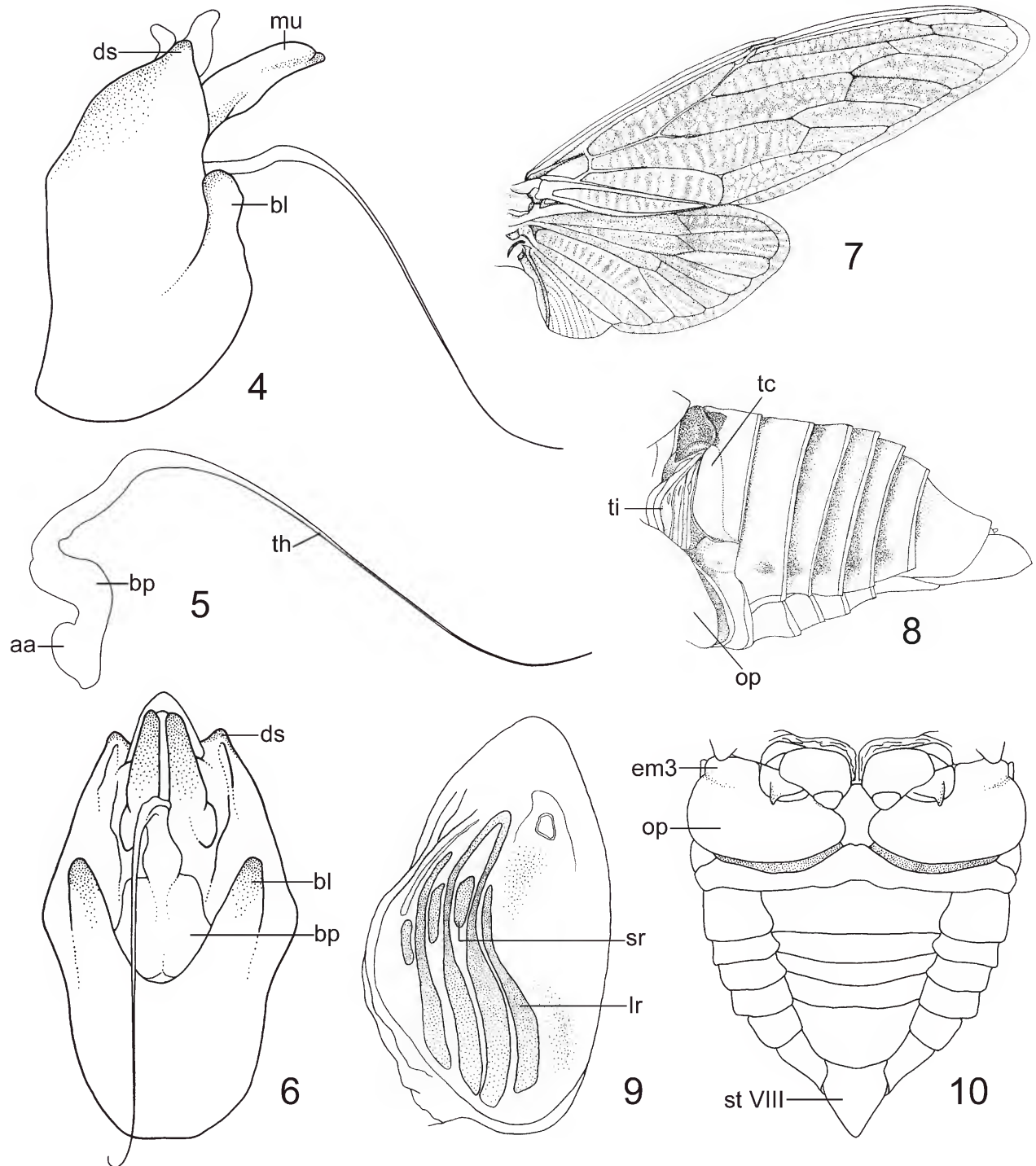
*Abdomen* (Figs 1–3, 8, 10). Male abdomen shorter than head plus thorax; that of female much longer. Male abdominal tergites with their sides weakly convex in cross-section, not partly concave; male tergites 2 and 3 larger than tergites 4–7; male sternites 3–7 gently convex in cross-section. Timbal covers (Fig. 8) small, covering no more than half timbal cavity. Timbals (Fig. 9) with large basal dome, the

type species with four long ribs spaced with prominent intermediate short ribs.

*Male genitalia* (Figs 4–6). Pygofer with distal shoulder extended into bluntly-pointed lobe; basal lobe undivided, broadly rounded; dorsal beak absent. Aedeagus restrained by tubular encapsulation on ventral surface of uncus; basal plate in lateral view sharply angled through  $90^\circ$ ; in dorsal view apical arms short, base broad and long with midline deeply furrowed; basal portion of basal plate directed forwards away from thecal shaft; junction between theca and basal plate rigid, without a “hinge”; thecal shaft gently curved; thecal apex entirely chitinized, thecal subapical cerci absent; legula absent; conjunctival claws absent; vesica retractable, vesica opening apical on theca.

#### Distinguishing characters

Fresh specimens have much of their body “dusted” white. The genus is best distinguished from all other Australian genera by the characters used for distinguishing the tribe as listed above.



**Figs 4–10.** *Talcopsaltria olivei* n.sp., male: (4) genitalia, lateral view; (5) the same, aedeagus, lateral view showing basal plate; (6) the same, ventral view; (7) fore and hind wings showing undulations of wing membrane; (8) lateral view of body showing reduced timbal cover; (9) left timbal; (10) ventral view of body showing opercula and abdomen. Abbreviations: *aa* apical arm of basal plate, *bl* basal lobe of pygofer; *bp* basal plate, *ds* distal shoulder of pygofer, *em3* remnant of epimeron 3, *lr* long rib, *mu* median lobe of uncus, *op* operculum, *sr* short rib, *st VIII* sternite eight, *tc* timbal cover, *th* theca, *ti* timbal.

## Discussion

The talc-like “dusting” on the body, both above and below, results from a very fine white waxy exudation. This white exudation is not uncommon in cicadas, occurring in many genera. It is, however, particularly extensive in *Talcopsaltria*, covering virtually the entire head and body of fresh specimens. It wears off with age and is easily removed from museum specimens by touching the body surface, relaxing of specimens for setting and wetting with alcohol or other solvents.

### *Talcopsaltria olivei* n.sp.

Figs 1–13

Species B—Ewart, 1993: 137–138, fig. 5; 2005: 177, fig. 10.

**Types.** HOLOTYPE male, Queensland, McIvor River road, 7 km from Isabella Falls, 35 km NW of Cooktown, 15°18.0'S 145°00.2'E, 9 Jan. 2006, J. Olive (QM). PARATYPES as follows: 5 males, 18.2km NW. Heathlands Stn., Cockatoo Ck–Heathlands Rd., Cape York Pen., 11°39.19'S 142°27.36'E, 28 Jan. 1992, *E. tetradonta* forest, A.E. [Ewart]; 1 male, as previously, 2 Feb. 1992; 4 males, as previously, 3 Feb. 1992 (AE). 1 male, AU.QLD.APX, 3 km W of Archer Point, 15°35.765'S 145°17.718'E, 57 m, 15 Jan. 2005, Hill, Marshall, Moulds (AM). 1 male, McIvor River road, 7 km from Isabella Falls, 35 km NW of Cooktown, 15°18.0'S 145°00.2'E, 9 Jan. 2006, J. Olive; 2 males, same locality, 7 Jan. 2007, J. Olive; 2 males, 1 female, same locality, 12 Jan. 2004, J. Olive; 2 males, same locality, 29 Mar. 2008, J. Olive; 2 males, 1 female, Archer Point road, S of Cooktown, 15°35.76'S 145°17.72'E, 12 Jan. 2003, D. Millar; 3 males, 1 female, same locality, 12 Jan. 2003, J. Olive; 1 male, same locality, 15 Jan. 2005, J. Olive; 1 male, same locality, 6 Jan. 2007, J. Olive (JO). 2 males, 1 female, 3 km NW of Archer Riv. x-ing, 13°24'S 142°55'E, 11 Apr. 1989, G. and A. Daniels; 1 female, AU.QL.NCO, 46 km N of Coen, 13°34.911'S 143°01.883'E, 127 m, 10 Jan. 2007, K. Hill, D. Marshall, M. Moulds; 1 female 7 km from Isabella Falls, 35 km NW of Cooktown, 15°18.0'S 145°00.2'E, 12 Jan. 2004, J. Olive; 3 males, 3 females, AU.QLD.APX, 3 km W of Archer Point, 15°35.765'S 145°17.718'E, 57m, 15 Jan. 2005, Hill, Marshall, Moulds; 1 male (genitalia prep. THE 1), Archer Point road, S of Cooktown, 15°35.76'S 145°17.72'E, 12 Jan. 2004, J. Olive (MSM). 2 males, McIvor River road, 7 km from Isabella Falls, 35 km NW of Cooktown, 15°18.0'S 145°00.2'E, 12 Jan. 2004, J. Olive (PH). 1 female, McIvor River road, 7 km from Isabella Falls, 35 km NW of Cooktown, 15°18.0'S 145°00.2'E, 9 Jan. 2006, J. Landy (QM).

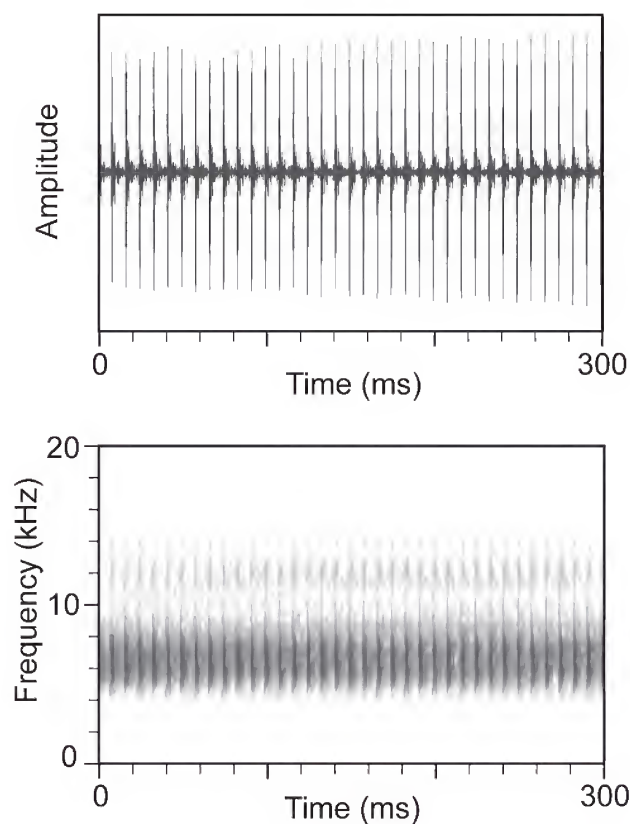
**Etymology:** Named in honour of John Olive who collected the majority of specimens.

## Description

**Male** (Figs 1, 3–6, 8–10): The head, thorax and abdomen are extensively “dusted” with a fine, white, waxy exudation, both above and below. Traces of this “dusting” can also be found scattered along the larger wing veins.

**Head** light to mid brown, variable between individuals; vertex with a black fascia of irregular width from eye to eye, surrounding each ocellus and branching to each supra-antennal plate; front of head with a narrow black fascia from eye to base of antenna and a short extension that follows postclypeal margin; anterior margin of eye socket finely edged black; anterior and posterior cranial depressions black; supra-antennal plates yellow along anterior margin. Postclypeus light brown, black along transverse grooves, in central part of depressed midline and at either side of “top”. Anteclypeus light brown with partly black rim and a large black patch along midline. Lorum light brown with partly glossy black margin. Rostrum pale brown, reaching beyond hind coxae; labium becoming black apically. Antennae dark brown, tending black in parts.

**Thorax** (Figs 1–3) light brown with black markings, pronotal collar olive green on fresh specimens with fine black edge to lateral margins. Pronotum with a pair of narrow black fasciae that are flanged at each end, one of these either side of



**Fig. 11.** Calling song of *Talcopsaltria olivei* n.sp.: oscillogram showing individual pulses of the song, above; sonogram at corresponding time scale showing frequency range, below.



midline; paramedian and lateral fissures marked with black; ambient fissure narrowly edged black. Mesonotum with submedian sigilla outlined black; outer margins of lateral sigilla black; ill-defined black markings at base of inner margin of lateral sigilla and between apices of submedian sigilla and cruciform elevation; black along wing groove; a black spot across each anterior arm of cruciform elevation before distal end; scutal depressions black. Metanotum black with distal rim light brown.

*Wings* (Figs 1–3, 7) hyaline, without infuscations, the wing membranes with more undulations than normal. Fore wing venation mostly brown, R+Sc palest; nodal region and depression between C and R+Sc often black; basal cell opaque, the distal portion and delimiting veins partly black; 3A black adjacent to basal membrane; basal membrane white or nearly so. Hind wing venation brown; 3A black; plaga white except for black abutting along 3A.

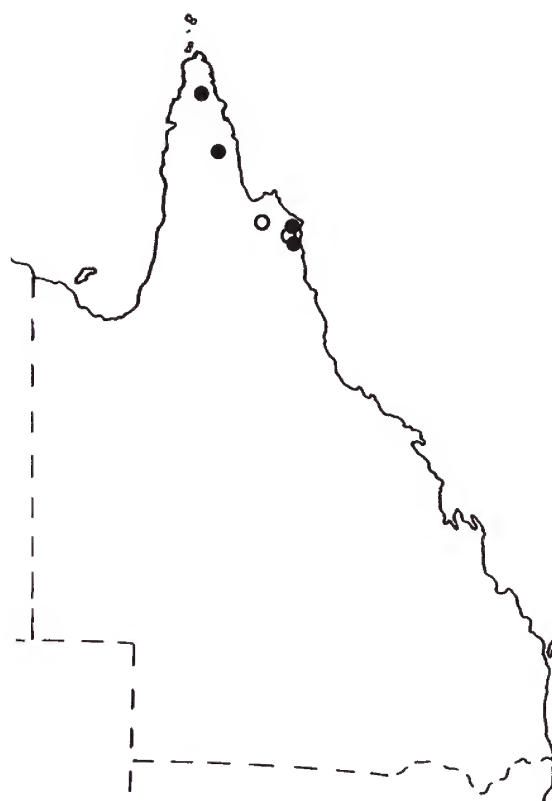
*Legs* pale to light brown; usually with indistinct longitudinal black fascia most obvious on fore legs; fore coxae often with either end partly rimmed black; fore trochanter often with a black blotch on shortest length; femora with a small black spot either side at distal end; tibiae usually with a black spot either side at proximal end and distal end usually with some black of variable extent; tarsi black at distal end, especially so on fore and mid tarsi; pretarsal claws black on apical half, dark brown on basal half. Meracanthus partly black basally, spur light brown.

*Opercula* (Fig. 10) pale yellowish brown, epimeron 3 a little darker and partly black.

*Abdomen* (Figs 1, 2, 8, 10). Tergites light to mid reddish brown, tending glossy. Tergite 1 almost entirely black; tergite 2 usually with a black blotch either side of midline near anterior margin, tergites 3–8 each with a black fascia on or near to anterior margin and usually restricted or broken on abdominal midline. Sternites light brown, glossy; sternite 8 sometimes tipped black. Timbal covers brown, usually with black suffusion. Timbals (Fig. 9) with four long ribs spaced with prominent intermediate short ribs.

*Genitalia* (Figs 4–6). Pygofer basal lobes evenly rounded apically; pygofer distal shoulder well developed, in lateral view broad, triangular and bluntly pointed. Uncal median lobe in lateral view nearly parallel-sided with an angled blunt apex, in dorsal view gradually tapering towards apex, slightly outwardly swollen just before apex, thereafter abruptly curving inwards to a short blunt point. Aedeagus with theca long, slender and tubular; the proximal quarter thickest, curved gently backwards and a little swollen distally; the remainder gently curved forwards proximally, gently backwards distally, gradually tapering to a simple angled apex.

**Female** (Fig. 2): Similar to male. Abdominal segment 9 brown with a pair of black subdorsal fasciae parallel with abdominal midline reaching a little over half way to dorsal beak, each fascia extended laterally to ventral surface along anterior margin of abdominal segment 9; sometimes a pair of small, curved fascia between distal ends of subdorsal fascia.



**Fig. 12.** *Talcopsaltria olivei* n.sp., distribution. Solid dots are capture records; circles are aural records.

### Measurements

Range and mean (in mm) for 10 males and 9 females; includes smallest and largest of available specimens. *Length of body*: male 22.5–28.5 (26.0); female 25.3–28.2 (26.8). *Length of forewing*: male 30.9–39.2 (36.0); female 37.4–41.0 (38.7). *Width of forewing*: male 9.7–11.9 (11.0); female 10.9–12.4 (11.6). *Ratio width/length of forewing*: male  $3.3 \pm 0.2$ ; female  $3.3 \pm 0.2$ . *Width of head (including eyes)*: male 8.8–11.3 (10.4); female 9.9–11.4 (10.9). *Width of pronotum (across lateral angles)*: male 9.6–12.3 (11.5); female 11.1–13.2 (12.3).

**Song** (Fig. 11): Ewart (1993, 2005) described and analyzed the song and provided waveform plots for specimens from Heathlands. He noted that periods of singing for four individuals lasted 12, 17, 18 and 25 minutes respectively. To the human ear the song has a buzzing quality, uninterrupted and without variation. As noted by Ewart the song actually consists of a sequence of rapid single pulses. These pulses are extremely short, each only about 1 ms in duration.

Ewart measured the pulse rate at some 130 per second with a frequency lying between 6 and 8 kHz. A recording of a specimen from north of Cooktown made by David Marshall (Fig. 11) showed a pulse rate of 120 per second with the majority of sound energy in the range 5–8 kHz with dominant frequencies between 6 and 6.5 kHz. Differences between the recordings of Ewart and Marshall are most likely due to differences in temperature (pulse rate) and individual variation (frequency).

The species is unusual for a large cicada in that it has no alarm call.

**Distribution, habitat and behaviour (Fig. 12)**

Cape York Peninsula, Queensland, south from Heathlands, through the Coen and Laura districts to Archer Point near Cooktown. There are records from five main localities: Heathlands in the far north (11°39'S 142°27'E), just north of the Archer River crossing on the main Peninsula Development Road (around 13°30'S 143°30'E), between Laura and the Old Laura Homestead (around 15°25'S 144°25'), north of Isabella Falls some 35 km NW of Cooktown (15°18'S 145°00'E), and 3 km W of Archer Point, south of Cooktown (15°36'S 145°18'E). Aural records include a little west of the road junction north of Isabella Falls, and between the Old Laura Homestead and Laura (J. Olive, pers comm.). There are records from 6 January to 11 April but most specimens have been taken during January and February.

Adults are usually found high in *Eucalyptus tetradonta* where they prefer the upper trunk and main limbs. They tend to be well camouflaged against the rough bark of the eucalypts, assisted in part by the black markings on the head and thorax and the black infuscations at the rear of the fore wings that form two longitudinal black bars overlaying the pale body when the wings are at rest (Fig. 3). On capture adults often play dead and there is no alarm call. Tony Ewart also noted that when specimens were attracted to light they simply dropped to the ground and lay still making it difficult to locate them. Populations tend to be localized, extending at most for just a few hundred metres.

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